

The COVID-19 vaccine intentions of Australian disability support workers

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Disability support workers (DSWs) are at significant risk of being infected and transmitting SARS-CoV-2 (hereafter referred to as COVID-19) due to the nature of their work, which often involves close physical contact with numerous people with disability.¹⁻³ Furthermore, the people with disability they support may be at greater risk of getting a more severe case of COVID-19 or dying if they become infected with COVID-19, sometimes because of underlying health conditions.⁴⁻⁸ The COVID-19 vaccine would mitigate these risks. This study explores DSW's COVID-19 perceptions and vaccine intentions.

The COVID-19 pandemic in Australia

Australia's experiences during COVID-19 have thus far been less significant than elsewhere with nearly 250,000 cases and 2,142 deaths reported as of 19 December 2021. In March and April 2020 Australia experienced its first wave of COVID-19, largely driven by returned travellers. Between June and October 2020, the state of Victoria experienced a second wave of COVID-19, and the third wave of the pandemic began in June 2021 in NSW and then Victoria and ACT. At the time of writing infections remain relatively high across Australia driven by the Omicron variant.

Across the world, there have been reports of COVID-19 outbreaks and deaths in congregate residential settings where groups of people with disability live (hereafter referred to as disability residential settings).^{8,9} During Victoria's second wave of COVID-19 and the third wave in NSW, Victoria and ACT, outbreaks in disability residential settings

Abstract

Objectives: Describe perceptions of COVID-19, COVID-19 vaccines, information sources, and levels and reasons for vaccine hesitancy among disability support workers (DSWs).

Methods: Cross-sectional survey of 252 DSWs from across Australia, between early March and early April 2021. Perceptions of risk of COVID-19; government and media representations; vaccination status (Y/N); vaccine intentions (when offered, delayed vaccinators, vaccine refusers); reasons for hesitancy; confidence in safety and efficacy of vaccine; and information sources.

Results: At the time of the survey, fewer than 1% of DSWs had been vaccinated and 17% had been offered vaccination. Of those who had not had the vaccine, 47% said they would get it as soon as it was offered; 19% would not get the vaccine; 12% would have if required; 13% hadn't decided; and 8% would wait until it was available for a while. Reasons for hesitancy included inadequate safety data (70% delayed vaccinators, 79% vaccine refusers), side effects (63% delayed vaccinators, 58% refusers), and distrust in the government (17% delayed vaccinators, 52% refusers). DSWs most trusted sources of information were their own doctor, Chief Medical Officers, and governments. 61% believed that COVID-19 will only stop if most of the community is vaccinated and 53% agreed the chances of them or their clients getting COVID-19 would be reduced if they were vaccinated.

Conclusions: Tailored information is needed to reduce vaccine hesitancy and increase confidence in COVID-19 vaccines among DSWs. The importance of getting vaccinated to prevent COVID-19 among people with disability should be emphasised.

Key words: disability, support workers, COVID-19, vaccination

have occurred although they are not reported publicly, instead being reported in the media.

Australia's vaccine rollout

Currently Australia has three vaccines with provisional approval from the Therapeutic Goods Administration (TGA). Comirnaty (Pfizer) was approved for use in Australians aged over 16 years on 25 January 2021 and Vaxzeria (AstraZeneca) was approved for use among Australians over the age of 18 years and older on 15 February 2021. On 9 August 2021, SpikeVax (Moderna) was approved for

use in Australians over 18 years of age. Pfizer is now approved for anyone over five years of age, Moderna for anyone over 12 years of age, and AstraZeneca for anyone over 18 years of age although not recommended for anyone less than 60 years of age. Pfizer and Moderna are now available as booster doses.

Given limited vaccine supply in early to mid-2020 the Australian government chose to roll out the vaccine among priority groups of people who were at serious risk of poor COVID-19 outcomes and/or those providing services to people who were clinically

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vulnerable, such as health care workers. The highest risk group being those in Phase 1A and were due to be vaccinated by the end of April 2020. Phase 1A included people with disability living in disability residential settings and the DSWs working in those settings and other DSWs were prioritised for Phase 1b.¹⁰

On 8 April, the Australian Government recommended the AstraZeneca vaccine be reserved for people over 50 years of age after there was consensus internationally that it was a possible cause of a rare but serious adverse event – Thrombosis with Thrombocytopenia Syndrome (TTS) – which is more common among younger people and women.^{11–13} This recommendation was updated on 17 June when AstraZeneca was not recommended for anyone under 60 years of age. In early June 2021, initial reports of myocarditis and pericarditis following Pfizer were reported,¹⁴ which have since been confirmed in epidemiological studies of mRNA vaccines although the course seems to be self-limited and occur mainly among young men.^{15,16}

While COVID-19 vaccine supply was initially limited by 19 December 2021 over 90% of the Australian population had received two or more doses of one of the approved vaccines.

Vaccine hesitancy among DSWs

Delay in the acceptance or refusal of vaccines – referred to as vaccine hesitancy¹⁷ – is a major challenge worldwide for the control of the COVID-19 pandemic.¹⁵ While DSWs were prioritised in Australia's vaccine rollout, we are not aware of any Australian research that describes the vaccine intentions of DSWs; a Canadian study of support workers providing support to people with intellectual disability found that 62% were very likely to get the vaccine.¹⁹

We conducted a cross-sectional survey of DSWs in Australia in March and early April 2020 to fill an important gap in our understanding of COVID-19 perceptions and vaccine intentions among DSWs and report the findings in this paper. First, we describe DSWs' perceptions of their own risk of becoming infected with COVID-19 as well their clients' risk of becoming infected. We also describe DSWs perceptions about media messaging regarding the seriousness of COVID-19 and their views on government restrictions introduced to prevent the spread of COVID-19. Second, we describe the vaccine

The known: Disability support workers (DSWs) were prioritised for COVID-19 vaccination

The new: DSWs had relatively high levels of vaccine hesitancy related to concerns about safety and side effects. Confidence in the efficacy of the vaccine to protect them, and their clients was moderate. There was not strong support for mandating the COVID-19 vaccine for DSWs. Government and doctors were trusted information sources.

The implications: There is an urgent need to produce tailored information on COVID-19 vaccines for DSWs to reduce vaccine hesitancy and improve understanding of the importance of them getting vaccinated to protect their clients.

intentions of DSWs, their confidence in the vaccine in protecting themselves and the people with disability they support, opinions about the vaccine, including whether they think it should be mandatory, and who they trust for information about the vaccine.

Methods

The survey was conducted between 5 March and 8 April 2021. DSWs were recruited via a link to the survey sent by disability services, unions and disseminated via social media. This survey link provided further information on the study and eligibility screening, all of which is outlined in further detail in the study report.² To be eligible, participants needed to be 18 years of age or older and currently working as a DSW. The survey was in English and administered online via the RedCap platform and participants were entered into a prize draw as a thank you for their participation.

The project received ethics approval from the University of Melbourne Human Ethics Committee (HREC: 2056824).

Variables

Table 1 details the questions we asked DSWs and how they were coded. The questions are broadly grouped as about: 1) COVID-19 infection, and 2) COVID-19 vaccination. In terms of COVID-19 infection, information was gathered about perceptions of risk of COVID-19 and government and media responses. In relation to vaccination, questions concerned: whether they had been vaccinated and, if not, their vaccine intentions. Participants who were vaccine hesitant were asked about the reasons for vaccine hesitancy. All participants were asked about their confidence and opinions about the vaccine; and sources of information and participant's trust in information.

The questions used in the survey were mostly derived or adapted from previous surveys.^{20,21} These included questions about vaccine intentions, reasons for hesitancy, perceptions of risk of COVID-19, government and media responses to COVID-19, perceptions about the safety and efficacy of the vaccine, opinions about the vaccine, and sources of trusted information from instruments used by the Kaiser Family Foundation.²¹ Questions from Larson et al. (2015) were also used to explore information sources and trust in information,²⁰ however, the authors also designed new questions specific to the Australian situation and the disability support workforce about vaccination status, perceptions of risk of COVID-19 for DSWs, and opinions about mandating the COVID-19 vaccine.

In addition to the questions about COVID-19, participants were also asked demographic variables including: age, gender (male, female, non-binary), country of birth (Australia or other English-speaking country, non-English speaking country), whether or not they were Aboriginal and/or Torres Strait Islander (Aboriginal and/or Torres Strait Islander, not Indigenous), State or Territory of residence, and highest education level (less than year 12, year 12 or equivalent, Certificate I or II, Certificate III or IV, associate degree, university degree).

Statistical analysis

Descriptive analyses were undertaken in Stata 16.²² Frequency of responses are reported as proportions with 95% confidence intervals. Supplementary Table 1 shows the missing data for the variables which ranged from <1% to 3% for all variables, with the exception of age (11%) and country of birth (6%). Because of the relatively small amount of missing data, we used a complete case analysis approach. We used all available data for each analysis, leading to analytic samples of different sizes.

Results

Table 2 shows the demographic details of the 252 DSWs who responded to the survey. Over half the sample were greater than 50 years of age (55%), the majority were female (73%), lived in Victoria (81%), and did not identify as Aboriginal or Torres Strait Islander (98%).

Table 1: Questions, response options and coding and sources of questions.		
Question	Response options & coding	Source of question
COVID-19 vaccination and intentions		
A. Vaccination status Have you had the COVID-19 vaccine?	1. Yes 2. No	Designed for survey
B. Offered vaccine If A=No Have you been offered to have the vaccine?	1. Yes 2. No	Designed for survey
C. Vaccine intentions If A=No When a vaccine for COVID-19 becomes available to you, do you think you will...?	1. Get the vaccine as soon as I can 2. Wait until it has been available for a while 3. Only get the vaccine if you are required to for work or other activities 4. Haven't decided if I will get vaccine or not 5. Will not get the vaccine Recoded as: 1=no vaccine hesitant 2 or 4=vaccine delayers 5=vaccine refusers	Adapted from Kaiser Family Foundation (2020) (18)
D. Reasons for hesitancy (vaccine delayers) If C=2 or 4	For each question: 1. Yes 2. No	Adapted from Kaiser Family Foundation (2020) (18)
1. There is inadequate data about the safety of the vaccine		
2. The vaccine will be ineffective		
3. I have had a prior adverse reaction to a vaccine		
4. I am against vaccines in general		
5. I am worried about possible side effects		
6. I am worried I might get COVID-19 from the vaccine itself		
7. I perceive myself as not at elevated risk to acquire COVID-19		
8. I have already had COVID-19		
9. I don't trust the government to make sure the vaccine is safe and effective		
10. Getting a vaccine is painful or inconvenient		
11. Because the vaccine is new, I want to wait to see how it affects others		
12. Other, please specify		
Perceptions of risk of COVID		
E. Worry about getting sick with COVID How worried, if at all, are you that you or someone in your family will get sick from COVID-19?	1. Very worried 2. Somewhat worried 3. Not too worried 4. Not at all worried, 5. Not applicable 6. Don't know Recoded as: 1,2= Worried 3,4=Not worried 5,6 not included in analysis n=14	Kaiser Family Foundation (2020) (18)
F. Risk of COVID-19 to DSW prior to vaccines Thinking back to 2020 before vaccines were available, please indicate on the below scale how strongly you agree or disagree with the following statements:	1. Strongly agree 2. Agree 3. Neither agree or disagree 4. Disagree 5. Strongly disagree Recoded as: 1,2=Agree 3-5=Other	Designed for survey
1. Disability support workers are at more risk of getting COVID-19 than people in the community		
2. The risk to disability support workers is greater if they work in group homes compared to disability support workers working in private homes		
3. If disability support workers get infected, then there is a high likelihood that they will infect others if they go to work		
Government and media response to COVID-19		
G. Government response In an effort to slow the spread of COVID-19, do you think your State or Territory has	1. Too many restrictions 2. Not enough restrictions 3. About the right amount of restrictions	Adapted from Kaiser Family Foundation (2020) (18)
H. Media portrayal Thinking about what is said in the news and on social media, in your view, is the seriousness of COVID-19	1. Generally exaggerated 2. Generally correct 3. Generally underestimated	Kaiser Family Foundation (2020) (18)

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Table 1 cont.: Questions, response options and coding and sources of questions.		
Question	Response options & coding	Source of question
Confidence in the vaccine		
I. Perceptions of risk, safety and efficacy and COVID-19 vaccine To what extent do you agree or disagree with the following statements:	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree Recoded as: 1,2=Agree 3-5=Other	Adapted from Kaiser Family Foundation (2020) (18)
1. Once the vaccine is available and approved, I know it is safe		
2. The vaccine is the best way to stop the COVID-19 pandemic		
3. The vaccine will only stop COVID-19 if most of the community is vaccinated		
4. The best way to avoid complications of COVID-19 is by being vaccinated		
5. I will be less worried about catching COVID-19 if I have the vaccine		
6. My chances of getting COVID-19 will decrease after I have the vaccine		
7. The clients are less likely to get COVID if I have had the vaccine		
8. I am concerned about how well the COVID vaccine will work		
9. I am concerned about the safety of the COVID vaccine		
10. I will only have the COVID vaccine if I am given adequate information about it		
11. I will only have the COVID vaccine if the vaccine is taken by many in the community		
Opinions about COVID-19 vaccine		
J. Motivation for vaccine Which of following comes closest to your view?	1. Getting vaccinated against COVID-19 is a personal choice 2. Getting vaccinated is part of everyone's responsibility to protect the health of others	Kaiser Family Foundation (2020) (18)
K. Mandating vaccine Do you support the vaccine being made compulsory for workers in the disability sector (with appropriate exemptions in place for medical reasons etc)?	1. Yes 2. No 3 Undecided	Designed for survey
L. Impact on mandate on employment as DSW Would you keep working as a disability support worker if the COVID-19 vaccine was made mandatory?	1. Yes 2. No 3 Undecided	Designed for survey
Information sources & trust in information		
M. Information sources Where do you get information related to the COVID-19 vaccine? (select all that apply)	1. Yes 2. No	Adapted from Larson et al. 2015 (17)
1. Your employer or online platforms (like Mable and HireUp)		
2. Your work colleagues		
3. Your clients		
4. Your friends and family		
5. Search engines (e.g., Google, Yahoo!)		
6. Government websites (e.g., Department of Health website)		
7. Wikipedia and other online encyclopedias		
8. Social media (e.g., Facebook, Instagram, Twitter)		
9. YouTube		
10. Blogs on health topics		
11. Official news media (e.g., on or offline media articles, newspapers, TV, radio)		
12. Other		
N. Most trusted information sources Who do you trust the most to give you information about the COVID-19 vaccine?	Select up to two options. 1. Yes 2. No	Adapted from Kaiser Family Foundation (2020) (18)
1. Government		
2. Your employer		
3. Family and friends		
4. The media		
5. Medical professionals		
6. Other		
O. Overall trust of information sources Please indicate how much you agree or disagree with the following statements regarding how much you trust the information you receive on the COVID-19 vaccine from different sources.	1. Strongly agree 2. Agree 3. Neither agree or disagree 4. Disagree 5. Strongly disagree Recoded as: 1,2=Agree 3-5=Other	Adapted from Larson et al. 2015 (17)
1. Information from the National/Federal Government can be trusted		
2. Information from my State Government can be trusted		
3. Information from Chief Medical Officers can be trusted		
4. Information from my own doctor can be trusted		
5. Information from pharmaceutical companies can be trusted		
6. Information from my family and friends can be trusted		
7. Information from social media (e.g., Facebook, Twitter) can be trusted		

COVID-19 infection – risks and representations

Perceptions of risk of COVID-19

As shown in Table 3, almost half (45%) of respondents reported not being worried they or a family member would get sick from COVID-19. Over half (51%) did *not* agree that DSWs were more at risk of COVID-19 than the rest of the community, that risk of COVID-19 was greater for DSWs working in group homes (51%), and that if DSWs got infected they were likely to infect others if they went to work (51%).

Government and media responses to COVID-19

Most participants thought the government had implemented the right amount of restrictions (73%) and the media's reporting of the seriousness of COVID-19 was correct (65%). It is notable that nearly a quarter of participants thought there were too many governmental restrictions in their state (24%) and that the media had exaggerated the seriousness of COVID-19 (22%).

COVID-19 vaccines – intentions; confidence; opinions; and information

COVID-19 vaccination and intentions

Of the 17% of participants (42/249) who had been offered vaccination, only one (0.4%) had been vaccinated. Of those who had not received the vaccine, 47% said they would have it straight away when offered. The other 52% described some degree of hesitancy including being 'vaccine refusers' (19%) or potential delayers (8% wait until available a while, 12% only if required, 13% haven't decided).

Table 4 shows the reasons for hesitancy. Among vaccine delayers the major reasons for hesitancy were inadequate data about safety (70%), worry about side effects (63%), and wanting to see how the vaccine affects others (57%). A similar proportion of vaccine refusers cited inadequate data about safety (79.2%), worries regarding side effects (58.3%), and wanting to see how the vaccine affects others (43.8%). Vaccine refusers also expressed other reasons for their decision, including distrust of the government (52.1% among refusers, 16.7% among delayers) and prior adverse reactions to a vaccine (27.1% among refusers, 7.4% among delayers). Only 6.3% of vaccine refusers were against vaccines in general. Previous COVID-19 infection was not mentioned by any delayers or refusers as

Table 2: Description of sample (eligible sample n=252).

	n	%	95% CI
Age (n=222)			
18-29	26	11.7	8.1, 16.7
30-49	73	32.9	27.0, 39.4
50-64	109	49.1	42.5, 55.7
65+	14	6.3	3.8, 10.4
Country of Birth (n=236)			
English speaking	200	84.8	79.6, 88.8
Non-English speaking	36	15.3	11.2, 20.5
Indigenous status (n=244)			
Aboriginal and/or Torres Strait Islander	5	2.0	0.9, 4.9
Not Aboriginal or Torres Strait Islander	239	98.0	95.2, 99.2
Gender (n=245)			
Female	178	72.7	66.7, 77.9
Male	64	26.1	21.0, 32.0
Non-binary	3	1.2	0.4, 3.8
State of residence (n=252)			
NSW	11	4.4	2.4, 7.7
ACT	3	1.2	0.4, 3.6
VIC	203	80.6	75.2, 85.0
QLD	11	4.4	2.4, 7.7
SA	3	1.2	0.4, 3.6
WA	20	7.9	5.2, 12.0
TAS	1	0.4	0.1, 2.8
Highest educational attainment (n=248)			
Less than year 12	15	6.1	3.7, 9.8
Year 12 or equivalent	19	7.7	4.9, 11.7
Certificate I or II	4	1.6	0.6, 4.2
Certificate III or IV	88	35.5	29.8, 41.7
Associate degree	54	21.8	17.1, 27.4
University degree	68	27.4	22.2, 33.3
Vaccination status (n=249)			
Vaccinated	1	0.4	0.06, 2.8
Offered vaccine but not vaccinated	41	16.5	12.3, 21.6
Not yet offered vaccine	207	83.1	77.9, 87.3

Table 3: Frequency of perceptions of risk of COVID-19 and government and media representations of COVID-19, per cent and 95%CI.

	n	%	95% CI
Worried about themselves or family getting sick (n=238)			
Very or somewhat worried	131	55.0	48.6, 61.3
Not worried	107	45.0	38.7, 51.4
Risk to disability support workers (strongly agree or agree)			
Disability support workers are at more risk of getting COVID-19 than people in the community (n=246)	120	48.8	42.6, 55.0
The risk to DSWs is greater if they work in group homes compared to DSWs working in private homes (n=231)	113	48.9	42.5, 55.4
If DSWs get infected, then there is a high likelihood that they will infect others if they go to work (n=242)	119	49.2	42.9, 55.5
Government response to COVID-19 (n=251)			
Too many restrictions	60	23.9	19.0, 29.6
Not enough restrictions	8	3.2	1.6, 6.3
About the right amount of restrictions	183	72.9	67.1, 78.1
Media portrayal of COVID-19 (n=247)			
Seriousness of COVID-19			
Exaggerated	54	21.9	17.1, 27.5
Correct	160	64.8	58.6, 70.5
Underestimated	33	13.4	9.6, 18.2

a reason for their decision, and no delayers cited perceived ineffectiveness of the vaccine, being against vaccines in general, or pain and inconvenience of getting a vaccine as reasons for delaying.

Confidence in COVID-19 vaccines

Concerns about vaccine safety were prevalent amongst participants as reported in Table 5. 61% of participants agreed they were concerned about the safety of the COVID-19 vaccine. Just over half of participants agreed the vaccine is the best way to stop the pandemic (57.0%).

There were moderate levels of endorsement of statements reflecting the effectiveness of the vaccine for disability support workers, their clients and the community, with approximately half of participants agreeing that they (51%) and their clients (53%) were less likely to contract COVID-19 following vaccination.

Opinions about the COVID-19 vaccine

As shown in Table 5, over half of respondents (54%) agreed the vaccine was primarily a community responsibility rather than a personal choice. Forty-three per cent of respondents agreed that the vaccine should be made compulsory for DSWs, while 19% were undecided and 38% disagreed. More than one-third of participants indicated they may not continue working as DSWs if the vaccine is made compulsory. Nearly all vaccine refusers (98%) did not agree that vaccination should be mandatory compared to 44% who were vaccine delayers (data not shown).

Information sources and trust in information

The most commonly reported sources of information used by respondents were government websites (71%), official news media (66%) and employers (64%). More

than half of respondents reported that the government (50%) and medical professionals (60%) were their most trusted sources of information. In terms of overall trust in information from different sources, medical professionals were again highly trusted as approximately three-quarters of DSWs agreed their doctor (76%) and Chief Medical Officers (72%) were a trusted source of information. Nearly two-thirds (63.6%) agreed information from National and State governments could be trusted (see Table 5).

Discussion

This survey of DSWs reveals low levels of vaccination and relatively high levels of vaccine hesitancy. Hesitancy was related to concerns about safety and side effects associated with the vaccine. Among the 19% of DSWs who would not get the vaccine, over half reported they did not trust the government to make sure it was safe. Only 6% of those who would not have the COVID-19 vaccine reported they were against all vaccines, indicating that refusal was specific to the COVID-19 vaccine. Findings from this study on levels of vaccine hesitancy among DSWs are consistent with the only moderate levels of confidence reported here in the effectiveness and safety of the vaccine to reduce individual and community risk and as the best way to stop the pandemic. Despite outbreaks in disability settings in Australia and internationally,^{8,9} as well as messaging around risk infection and transmission in the workforce during COVID-19,²³ only half appeared to recognise they were at increased risk of COVID-19 infection. Similarly, only half reported that getting the vaccine would reduce risk of COVID-19 for them and their clients. Governments and medical professionals were the most common and trusted sources of information.

The level of vaccine hesitancy reported in this study is higher than that reported among the general population.^{19,24-27} Australian research conducted in April 2021 reported 9% of Australians had at least one COVID-19 vaccination with 55% saying they definitely would have the vaccine, 28% that they probably would, 11% they probably wouldn't and 6% that they definitely wouldn't.²⁶ These levels of vaccine hesitancy are higher than found in the same surveys of Australians conducted in mid-2020.^{18,26} Another Australian survey, conducted in late May-June 2021, found that 21% of Australians had been vaccinated, 50% were willing to be vaccinated, 13% did not know if they would be vaccinated and 16% were unwilling to be vaccinated.²⁷ The level of vaccine hesitancy reported here is also higher than that reported among similar workers internationally,^{19,24,25} however, questions differ between surveys; for example, a Canadian study of workers who supported people with intellectual disability found 62% reporting they were 'very likely' to get the vaccine and concerns about safety and side effects were major predictors of whether or not a worker intended to be vaccinated.¹⁹ This survey was conducted before the Australian government's announcement to restrict use of AstraZeneca to those aged 60 years and older, there had already been considerable media coverage of TTS before the announcement, which may have contributed to the low levels of vaccination and high levels of hesitancy we found.

While people obtained their information from a variety of sources including government, news and social media, it is notable that the most trusted sources of information were government and medical professionals highlighting the importance of disseminating information through official channels. It is concerning that nearly half of DSWs did not

Table 4: Reasons for hesitancy among vaccine delayers (n=54) and vaccine refusers (n=48).

	Vaccine delayers			Vaccine refusers		
	n	%	95% CI	n	%	95% CI
There is inadequate data about safety of the vaccine	38	70.4	56.6, 81.2	38	79.2	65.0, 88.6
The vaccine will be ineffective	0	0	0	11	22.9	13.0, 37.2
I have had a prior adverse reaction to a vaccine	4	7.4	2.7, 18.5	13	27.1	16.2, 41.7
I am against vaccines in general	0	0	0	3	6.3	2.0, 18.1
I am worried about possible side effects	34	63.0	49.1, 75.0	28	58.3	43.7, 71.6
I am worried I might get COVID from the vaccine	4	7.4	2.7, 18.5	4	8.3	3.1, 20.6
I perceive myself as not at elevated risk to acquired COVID	2	3.7	0.9, 14.0	9	18.8	9.9, 32.7
I don't trust the government to make sure the vaccine is safe and effective	9	16.7	8.8, 29.4	25	52.1	37.8, 66.0
Getting a vaccine is painful or inconvenient	0	0	0	1	2.1	0.3, 14.0
I want to see how the vaccine affects others	31	57.4	43.7, 70.1	21	43.8	30.2, 58.3

perceive themselves to be at increased risk of COVID-19 and that just over half thought vaccines would protect themselves and/or their clients from COVID-19. This may reflect the low levels of health literacy in this group that we have reported previously¹ and the relatively low levels of trust in government.

Strengths and limitations

To the best of our knowledge, this is the only study of COVID-19 vaccination perceptions and intentions among DSWs in Australia. However, the sample may not be representative of the entire DSWs workforce as recruitment was through unions, services, and social media. There is no register of DSWs in Australia and therefore it is impossible to know the response rate. Further, the lack of population data describing the characteristics of disability support workforce means we cannot compare our sample to the population or DSWs. The majority of participants were from Victoria, where there was a second wave of infection in mid-2020, and so may not be representative of population of DSWs across Australia. The relatively small sample size meant that it was not possible to conduct more detailed analyses by subgroups such as age and/or the state or territory they resided in. Finally, while a major strength of our study was the use of existing instruments, there were also some drawbacks where questions may have revealed some difficult to interpret responses. For example, the question about whether media exaggerated the seriousness of COVID-19, this option included both mainstream news media and social media. Australian research has shown that trust in news media is higher than for social media¹⁵ and so combining these may be problematic.

Policy implications and recommendations

Rollout of the COVID-19 vaccine in the disability sector has been referred to as an 'abject failure' by the Disability Royal Commission with only 1,000 of 26,000 residents having received one dose of a COVID-19 vaccine by mid-May 2021.²⁸ Vaccine hesitancy among DSWs, combined with failure of implementation of vaccine rollout in the disability sector, has left many people with disability at significant risk of COVID-19. Previous research has shown that DSWs have felt left behind by government during the pandemic^{1,2,29} and much work needs

Table 5: Confidence in and opinions about COVID-19 vaccine and sources and trust in information, per cent and 95%CI.

	n	%	95%CI
Confidence in vaccine (agree or strongly agree)			
Once the vaccine is available and approved, I know it's safe (n=251)	118	47.0	40.9, 53.2
The vaccine is the best way to stop the COVID-19 pandemic (n=249)	142	57.0	50.8, 63.1
The vaccine will only stop COVID-19 if most of the community is vaccinated (n=249)	152	61.0	54.8, 66.9
The best way to avoid complications of COVID-19 is by being vaccinated (n=250)	130	52.0	45.8, 58.2
I will be less worried about catching COVID-19 if I have the vaccine (n=250)	134	53.6	47.4, 59.7
My chances of getting COVID-19 will decrease after I have the vaccine (n=250)	127	50.8	44.6, 57.0
The clients are less likely to get COVID if I have had the vaccine (n=248)	132	53.2	47.0, 59.4
I am concerned about how well the COVID vaccine will work (n=248)	150	60.5	54.2, 66.4
I am concerned about the safety of the COVID vaccine (n=250)	153	61.2	55.0, 67.1
I will only have the COVID vaccine if I am given adequate information about it* (n=248)	128	51.6	45.4, 57.8
I will only have the COVID vaccine if the vaccine is taken by many in the community* (n=245)	59	24.1	19.1, 29.9
Opinion – Motivation for COVID-19 vaccine (n=248)			
Personal choice	114	46.0	39.8, 52.2
Community responsibility	134	54.0	47.8, 60.2
Opinion - Mandating for DSWs (n=252)			
Yes	109	43.3	37.2, 49.5
No	95	37.7	31.9, 43.9
Undecided	48	19.1	14.6, 24.4
Impact of mandate on continuing to work as DSW (n=250)			
Yes	161	64.4	58.2, 70.1
No	48	19.2	14.8, 24.6
Undecided	41	16.4	12.3, 21.6
Information sources			
Your employer	161	63.9	57.7, 69.6
Your work colleagues	29	11.5	8.1, 16.1
Your clients	9	3.6	1.9, 6.7
Search engines	71	28.2	22.9, 34.1
Government websites	178	70.6	64.7, 76.0
Wikipedia and other online encyclopedias	6	2.4	1.1, 5.2
Social media	63	25.0	20.0, 30.7
Youtube	17	6.7	4.2, 10.6
Blogs on health topics	21	8.3	5.5, 12.5
Official news media	165	65.5	59.4, 71.1
Most trusted sources of information (n=252)			
Government	125	49.6	43.4, 55.8
Your employer	49	19.4	15.0, 24.8
Family and friends	4	1.6	0.6, 4.2
The media	8	3.2	1.6, 6.2
Medical professionals	150	59.5	53.3, 65.4
Overall trust in information sources			
National/Federal government (n=250)	159	63.6	57.4, 69.4
State government (n=250)	160	64.0	57.8, 69.7
Chief Medical Officers (n=250)	180	72.0	66.1, 77.2
My own doctor (n=250)	190	76.0	70.3, 80.9
Pharmaceutical companies (n=248)	79	31.9	26.3, 37.9
Family and friends (n=246)	51	20.7	16.1, 26.3
Social media (e.g., twitter, facebook) (n=245)	18	7.3	4.7, 11.4

to be done to build trust and confidence in the vaccine among this workforce. Previous research has also shown that encouraging altruism in making vaccine decisions would improve uptake of influenza vaccination.³⁰

Since this research was done much has changed in relation to vaccination in Australia. With over 90% of the Australian population over 16 years of age double vaccinated, it is clear vaccine hesitancy among Australians is now low. Furthermore, vaccine mandates for DSWs have been announced in all States and Territories. On 19 December 2021, 85% of National Disability Insurance Scheme (NDIS) screened workers (a subset of DSWs) had had at least two doses of a COVID-19 vaccine. It is not known how many DSWs left the workforce because of the vaccine mandate. Furthermore, the situation has changed dramatically with the emergence of Delta as the major strain in mid 2021 and Omicron in late 2021. Nonetheless, this research provides a number of important insights which should be considered to ensure unvaccinated workers are vaccinated and DSWs receive boosters and further COVID-19 vaccinations considered necessary in the future. We recommend that information for DSWs understand their risk of acquiring and transmitting COVID-19 and that vaccination is important to protect their clients who may be clinically vulnerable with high risks of experiencing serious illness or death if infected with COVID-19. We recommended that in future information is co-designed with DSWs and delivered by trusted sources (such as medical professionals). We recommend that Government work with providers and DSWs to develop strategies which enable that DSWs are easily able to be vaccinated such as paid leave, workplace vaccination, and priority access.

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References

1. Kavanagh A, Dimov S, Shields M, McAllister A, Dickinson H, Kavanagh M. *Disability Support Workers: Follow Up Findings from The Forgotten Workforce in COVID-19 - Research Report*. Melbourne (AUST): The University of Melbourne; 2021.
2. Kavanagh A, Dimov S, Shields M, McAllister A, Dickinson H, Kavanagh M. *Disability Support Workers: The Forgotten Workforce in Covid-19*. Melbourne (AUST): The University of Melbourne; 2020.

3. Baker MG, Peckham TK, Seixas NS. Estimating the burden of United States workers exposed to infection or disease: A key factor in containing risk of COVID-19 infection. *PLoS One*. 2020;15(4):4–11.
4. Hodgson K, Grimm F, Vestesson E, Brine R, Deeny S. *Briefing: Adult Social Care and COVID-19. Assessing the Impact on Social Care Users and Staff in England So Far*. London (UK): The Health Foundation; 2020.
5. Landes SD, Turk MA, Damiani MR, Proctor P, Baier S. Risk factors associated with COVID-19 outcomes among people with intellectual and developmental disabilities receiving residential services. *JAMA Netw Open*. 2021;4(6):e2112862.
6. Landes SD, Turk MA, Formica MK, McDonald KE, Stevens JD. COVID-19 outcomes among people with intellectual and developmental disability living in residential group homes in New York State. *Disabil Health J*. 2020;13(4):100969.
7. Turk MA, Landes SD, Formica MK, Goss KD. Intellectual and developmental disability and COVID-19 case-fatality trends: TriNetX analysis. *Disabil Health J*. 2020;13(3):100942.
8. Gleason J, Ross W, Fossi A, Blonsky H, Tobias J, Stephens M. Commentary: The devastating impact of Covid-19 on individuals with intellectual disabilities in the United States. *NEJM Catalyst Innovations in Care Delivery*. 2021 March 5. doi: 10.1056/CAT.21.0051
9. Kinesella E, Campanella N. Coronavirus outbreaks grow in Victorian group homes for people living with disabilities. *ABC News*. 2020 Aug;7:6:12pm [cited 2021 Jun 21]. Available from: <https://www.abc.net.au/news/2020-08-07/fears-coronavirus-spreading-disability-group-home-care-victoria/12535692>
10. Australian Government Department of Health. *Australia's COVID-19 Vaccine National Roll-out Strategy*. Canberra (AUST): Government of Australia; 2020 [cited 2021 Jun 12]. Available from: <https://www.health.gov.au/sites/default/files/documents/2021/01/covid-19-vaccination-australia-s-covid-19-vaccine-national-roll-out-strategy.pdf>
11. Scully M, Singh D, Lown R, Poles A, Solomon T, Levi M, et al. Pathologic Antibodies to platelet factor 4 after ChAdOx1 nCoV-19 vaccination. *N Engl J Med*. 2021;384(23):2202–11.
12. Schultz NH, Sørvoll IH, Michelsen AE, Munthe LA, Lund-Johansen F, Ahlen MT, et al. Thrombosis and thrombocytopenia after ChAdOx1 nCoV-19 vaccination. *N Engl J Med*. 2021;384(22):2124–30.
13. Greinacher A, Thiele T, Warkentin TE, Weisser K, Kyrle PA, Eichinger S. Thrombotic thrombocytopenia after ChAdOx1 nCoV-19 vaccination. *N Engl J Med*. 2021;384(22):2092–101.
14. Israel Ministry of Health. *Surveillance of Myocarditis (Inflammation of the Heart Muscle) Cases Between December 2020 and May 2021 (Including)* [Internet]. Jerusalem (IL): Government of Israel; 2021 [cited 2021 Dec 21]. Available from: <https://www.gov.il/en/departments/news/01062021-03>
15. Mevorach D, Anis E, Cedar N, Bromberg M, Haas EJ, Nadir E, et al. Myocarditis after BNT162b2 mRNA VACCINE against Covid-19 in Israel. *N Engl J Med* [Internet]. 2021 [cited 2021 Dec 21];385(23):2140–9. Available from: <https://www.nejm.org/doi/full/10.1056/NEJMoa2109730>
16. Witberg G, Barda N, Hoss S, Richter I, Wiessman M, Aviv Y, et al. Myocarditis after Covid-19 vaccination in a large health care organization. *N Engl J Med* [Internet]. 2021 [cited 2021 Dec 21];385(23):2132–9. Available from: <https://www.nejm.org/doi/full/10.1056/NEJMoa2110737>
17. MacDonald N, The SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: Definition, scope and determinants. *Vaccine*. 2015;33:4161–4.
18. Attwell K, Lake J, Sneddon J, Gerrans P, Blyth C, Lee J. Converting the maybes: Crucial for a successful COVID-19 vaccination strategy. *PLoS One*. 2021;16(1):e0245907
19. Lunsley Y, Kithulegoda N, Thai K, Benham JL, Lang R, Desveaux L, et al. Beliefs regarding COVID-19 vaccines among Canadian workers in the intellectual disability sector prior to vaccine implementation. *J Intellect Disabil Res*. 2021;65(7):617–25.
20. Larson HJ, Jarrett C, Schulz WS, Chaudhuri M, Zhou Y, Dube E, et al. Measuring vaccine hesitancy: The development of a survey tool. *Vaccine*. 2015;33(34):4165–75.
21. Hamel L, Lopes L, Sparks G, Stokes M, Brodie M. *KFF COVID-19 Vaccine Monitor – December 2020*. San Francisco (CA): Kaiser Family Foundation; 2020 [cited 2021 Jun 12]. Available from: <https://www.kff.org/coronavirus-covid-19/report/kff-covid-19-vaccine-monitor-december-2020/>
22. STATA: statistical software. Release 16. College Station (TX): Stata Corp; 2019.
23. Australian Government Department of Health. *Coronavirus (COVID-19) Advice for the Health and Disability Sector* [Internet]. Canberra (AUST): Government of Australia; 2020 [cited 2021 Jun 12]. Available from: <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-advice-for-the-health-and-disability-sector>
24. Kose S, Mandiracioglu A, Sahin S, Kaynar T, Karbus O, Ozbel Y. Vaccine hesitancy of the COVID-19 by health care personnel. *Int J Clin Pract*. 2021;75(5):17–20.
25. Karafillakis E, Dinca I, Apfel F, Cecconi S, Würz A, Takacs J, et al. Vaccine hesitancy among healthcare workers in Europe: A qualitative study. *Vaccine*. 2016;34(41):5013–20.
26. Biddle N, Edwards A Ben, Gray M. *Change in Vaccine Willingness in Australia: August 2020 to January 2021*. Canberra (AUST): Australian National University Centre for Social Research and Methods; 2021. Available from: https://csrm.cass.anu.edu.au/sites/default/files/docs/2021/5/Vaccine_willingness_and_concerns_in_Australia_-_August_2020_to_April_2021.pdf
27. Lim G, Nguyen V. *June: Survey of the Impact of COVID-19 in Australia: Taking the Pulse of the Nation*. Melbourne (AUST): The University of Melbourne Melbourne Institute; 2021. Available from: https://melbourneinstitute.unimelb.edu.au/__data/assets/pdf_file/0007/3814468/Taking-the-Pulse-of-the-Nation-31-May-5-June-2021.pdf
28. Henriques-Gomes L. 'Abject failure': Only 999 out of 26,000 Australian disability care residents vaccinated. *The Guardian*. 2021 May;17:5:50pm [cited 2021 Jun 12]. Available from: <https://www.theguardian.com/australia-news/2021/may/17/abject-failure-only-834-out-of-23000-australian-disability-care-residents-vaccinated>
29. Huska M, Dickinson H, Devine A, Dimov S, Kavanagh A. *Managing COVID-19 Outbreaks in Disability Residential Settings: Lessons from Victoria's Second Wave*. Melbourne (AUST): The University of Melbourne Centre of Research Excellence in Disability and Health; 2021.
30. Shim E, Chapman GB, Townsend JP, Galvani AP. The influence of altruism on influenza vaccination decisions. *J R Soc Interface*. 2012;9(74):2234–43.

Supporting Information

Additional supporting information may be found in the online version of this article:

Supplementary Table 1: Frequency of missing data, n and percent of sample (n=252).